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STORIES

Bold and forward-thinking leaders

Arek Oy streamlines pension calculations by moving to Google Cloud

Demand for digital

Arek Oy delivers pension calculation services to all pension providers in Finland. These calculations, based on decades worth of data, are highly regulated and extremely complicated. They also come with stringent compliance and accuracy requirements. Historically, the company calculated the value of every Finnish citizen's pension via a proprietary mainframe application and MIPS (million instructions per second) architecture. These valuations—drawn from analyses of 22 million lines of code and 7,000 COBOL modules—were then regularly passed along to the pension providers in the form of standardized reports.

This approach to pension calculations had worked well for years. But the Finnish people are quite digitally savvy. They have grown accustomed to digital self-service functionality in many aspects of their lives and expected the same level of convenience from their pension providers. Specifically, they wanted to be able to query their pension providers and see their pension valuations whenever they wanted.

As the demand for digital and self-service capabilities was set to rise exponentially, Arek Oy needed to make a choice. It could update the existing MIPS architecture to accommodate growing demand. But the static costs associated with running the infrastructure were high and the COBOL skills needed to maintain it were in short supply. The other option was revolutionary. It involved shifting its system of pension calculations from the mainframe to a private cloud solution. The advantages of this approach were readily apparent. A dynamically and infinitely scalable architecture would significantly reduce costs. It would also enable Arek Oy—and, by extension, Finland's pension providers—to better serve the Finnish people.

Given the novelty of the desired solution, the complexity of the calculations to be migrated, and the accuracy that was required, Arek Oy wanted to team with a service provider that brought deep industry expertise, as well as data, digital and cloud know-how to forge the right path forward. Accenture, which had provided Arek Oy with technology guidance and support for more than 15 years, met all these requirements and quickly jumped in to facilitate the transformation.

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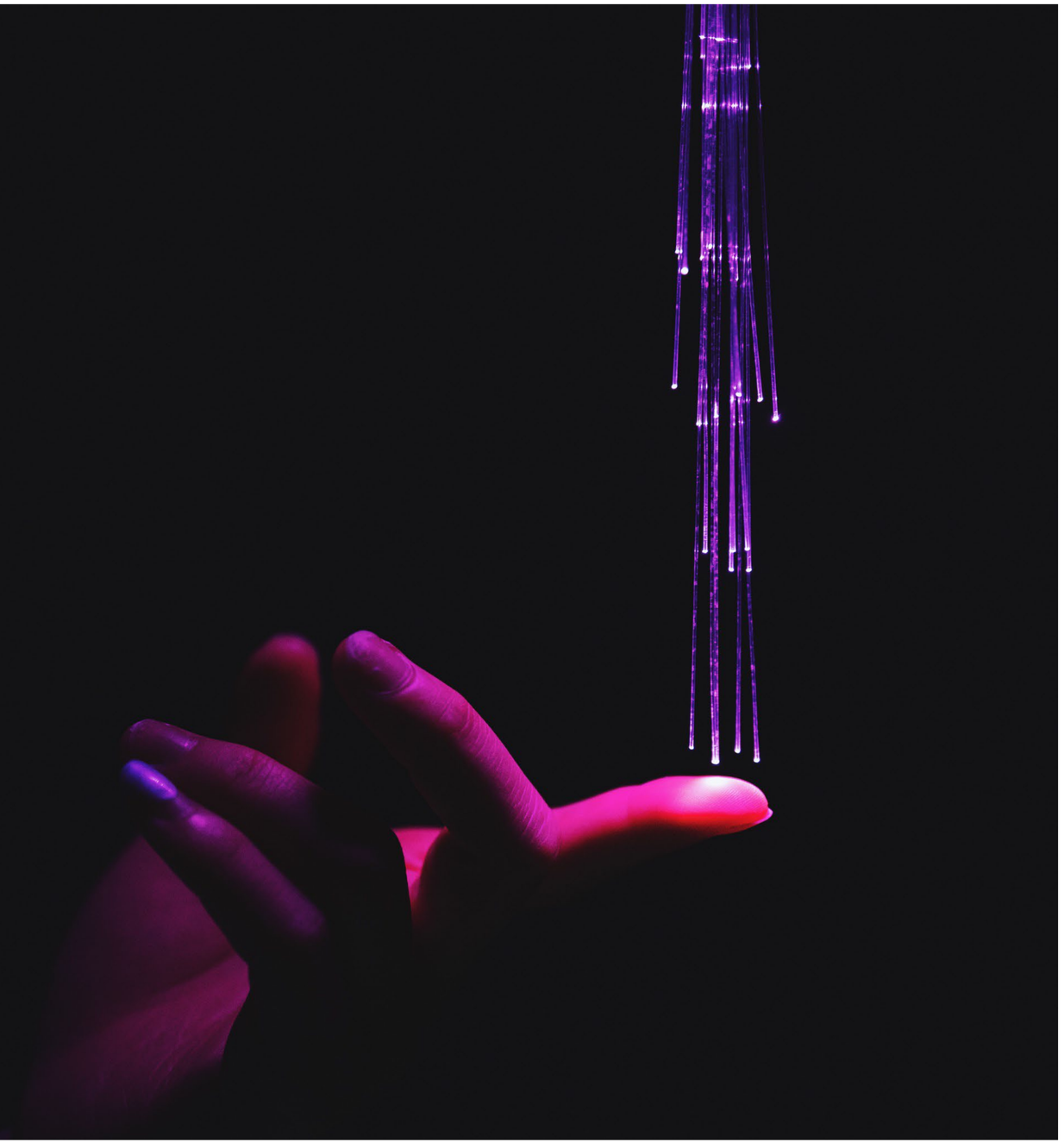
When tech meets human ingenuity

Security with precision

As a first step in its transformation, Arek Oy made the decision to use Heirloom Computing's re-platforming solution to refactor its pension calculation engine as a cloud-native Java service running on Kubernetes (an open-source system for automating software development and management). But the company understood that re-platforming was about more than just converting its 22 million lines of code. It would require a high-performance testing environment to ensure all pension calculations were converted accurately.

Arek Oy worked closely with Accenture to establish the necessary structure and technical framework to facilitate the conversion to Google Cloud—and, specifically, to the Google Cloud's Anthos application management platform. Arek Oy selected this platform because of its faster CPUs and the fact that Google operated a Finland-based data center which would meet the country's strict requirements for keeping sensitive data within its borders.

The team started by identifying the key requirements of the new solution. One of these was that the performance of individual calculations in the Anthos environment needed to match the mainframe performance perfectly. Arek Oy needed to be able to scale the cloud-based application in real time as demand varied. And a new DevOps pipeline needed to be able to support ongoing application development and source code changes on the mainframe and then automatically deploy those changes to the Anthos infrastructure.



When tech meets human ingenuity

With the requirements and main technical components identified, Arek Oy and Accenture executed a proof-of-concept project that performed end-to-end test calculations across a small subset—approximately 4%—of the application code. The migrated code executed correctly on the Kubernetes infrastructure, producing exactly the same results as the mainframe and with comparable response times.

Following the successful proof of concept, Arek Oy and Accenture built an automated DevOps pipeline for refactoring and deploying the complete mainframe application to the cloud. The team also built a testing robot and invited users of the pension calculation engine to submit their own test cases to the new system. Integrating the new calculation engine with pension fund systems and opening the solution up to more queries enabled the team to carry out performance load testing across thousands of pension calculation messages. These actions also confirmed that the cloud-based engine continued to produce the correct results, despite the significant uptick in calculation numbers and complexity.

Rounding out the technical solution were an Azul Java Virtual Machine (JVM), which optimized memory and performance, and a horizontal pod auto-scaler, which automatically increased the number of Kubernetes pods as the workload grew and scaled them back when demand declined. The ability to scale the solution on the fly yielded significant performance improvements. Only two Kubernetes pods were required to outperform the mainframe system by 26%. With four pods, outperformance reached 152%, with an average response time of less than 600 milliseconds.

Beyond creating the solution's technical framework and automated DevOps pipeline, Accenture worked with Arek Oy to identify—and eliminate—any discrepancies between the mainframe and cloud calculations that emerged during testing. Importantly, the team also addressed the underlying causes of the deviations. This often involved correcting historical defects and fixing COBOL source code.

While Accenture is currently maintaining the application and DevOps pipeline, the team designed the solution to be repeatable, reusable, and inheritable. Further, everything about the solution is fully documented. This means that Arek Oy or other maintenance providers could seamlessly step in if needed in the future.

A valuable difference

Real time dynamic scale

The migration of Arek Oy's entire pension calculation engine to Anthos was completed in under a year—and generated positive results much sooner than that.

Moving the calculation engine to a Kubernetes cluster managed by Anthos and executing it on an Azul JVM has enabled Arek Oy to improve its services to pension providers and to the millions of pensioners who rely on accurate, fast calculations. The highly automated, cloud-based solution is integrated with pension providers' systems across Finland—thereby enabling them to meet pensioners' requirements more efficiently.

Importantly, running the application on a private cloud is generating significant cost savings for Arek Oy. In fact, the company's cost per transaction is projected to drop by more than 80% as a result of utilizing the Kubernetes infrastructure on Anthos instead of the legacy mainframe. On top of all this, Arek Oy has been able to eliminate the yearly expense of expanding the mainframe system's computing architecture. In the new cloud environment, Arek Oy can dynamically scale its computing power as needed, in real time and at minimal cost.

Together, the lower cost per transaction and the ability to scale on-demand are having a direct and positive impact on pensioners' experiences—and the profitability of Arek Oy. Its leaders were bold and forward-thinking when they decided to move the company's most critical application to the cloud. Their calculated risk has paid off handsomely.

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